Pediatric Respiratory Emergencies: Croup

> **Note Well:** *Croup is characterized by a loud cough that resembles the barking of a seal, difficulty breathing, and a grunting noise or wheezing on breathing. At first, a child may have an upper respiratory infection for several days before the onset of cough. As the upper airway (vocal cords and the areas just below them) become progressively inflamed and swollen, the child may become hoarse, with a harsh, barking cough. If the upper airway becomes more obstructed, the labor of breathing becomes intense. With severe croup, there may be a high-pitched noise ("stridor") when breathing in. Children with viral croup may have a fever. Symptoms often worsen at night and with crying. In addition to the effects on the upper airway, the infections that cause croup can result in inflammation further down the airway, including the bronchi and the lungs. Possible airway obstruction is a major concern.*

I. *All Provider Levels*

1. Follow the General Patient Care guidelines in section A1.

2. If no breathing is present, then position the airway and start bag valve ventilations using 100% oxygen.

   A. Refer to the pediatric chart for appropriate rates.

3. If airway can not be maintained initiate advanced airway management using a combi-tube.

   > **Note Well:** *Do not use a combi-tube on a patient younger than 16 years of age or less than 5-feet tall.*

   > **Note Well:** *The EMT-I and EMT-P should use ET intubation.*

4. Call for ALS support. Initiate care and do not delay transport waiting for an ALS unit.

I. All Provider Levels (continued)

5. If breathing is adequate, place the child in a position of comfort and administer high flow, 100% oxygen.

    A. Use a non-rebreather mask or blow by as tolerated.

6. Assess for signs and symptoms of croup.

7. Consider establishing an IV of normal saline.

> **Note Well:** BLS Providers cannot start an IV on a patient less than eight years of age

> **Note Well:** An ALS unit must be en route or on scene.

> **Note Well:** If IV access cannot be readily established and the child is younger than 6 years of age then ALS Providers only may proceed with IO access. If the child is over 6 years of age, then contact Medical Control for IO access.

8. If the patient is 8 years of age or less and if the patient shows signs of respiratory distress or respiratory failure together with clinical evidence of croup

    A. Administer 3cc of normal saline via nebulizer for 3-5 minutes.

9. Assess vital signs.

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II.   Advanced Life Support Providers

1.   Initiate cardiac monitoring.

2.   If the patient is 8 years of age or less and the patient continues to shows signs of respiratory distress or respiratory failure together with clinical evidence of croup

   A.   Administer epinephrine 1:1000 via nebulizer (*Med Control Option Only*)
   i.   < 4 years old = 2.5 ml/dose
   ii.   > 4 years old = 5.0 ml/dose

> *Note Well: Each dose of medication must be diluted in normal saline to at least 3 ml of total fluid.*

III.   Transport Decision

1.   Contact medical control for additional instructions.

2.   Initiate transport to the nearest appropriate facility as soon as possible.

3.   Perform focused history and detailed physical exam en route to the hospital.

4.   Reassess at least every 3-5 minutes, more frequently as necessary and possible.

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IV. The Following Options are Available by Medical Control Only

1. Additional instructions

2. Epinephrine 1:1000 via nebulizer

    A. < 4 years old = 2.5 ml/dose

    B. > 4 years old = 5.0 ml/dose

> ***Note Well:*** *Each dose of medication must be diluted in normal saline to at least 3 ml of total fluid.*

3. IO access for patients greater than 6 years of age.

This protocol was developed and revised by Children's National Medical Center, Center for Prehospital Pediatrics, Division of Emergency Medicine and Trauma Services, Washington, D.C.